

EROSION OF INTERNAL CAROTID ARTERY DURING SCARLET FEVER; HÆMORRHAGE FROM EXTERNAL AUDITORY MEATUS; LIGATION OF COMMON CAROTID; RECOVERY.

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EROSION of the internal carotid due to suppuration of the middle ear or to caries of the petrous bone, is a rare accident, and one which appears to have been uniformly fatal in its results. Politzer (*Diseases of the Ear*, 1883), on the authority of Hessler, states that only thirteen cases are to be found scattered throughout medical literature, in every one of which a fatal issue enabled the diagnosis of ulceration of the internal carotid artery to be confirmed by post-mortem examination. The list does not make special reference to scarlet fever as a cause of erosion, but includes most of the known forms of caries of the temporal bone, as syphilis and scrofula, etc. *

Case.—A young girl of 15 had passed the third week of a severe attack of scarlet fever without other complication than a good deal of cervical adenitis. She then began to complain of pain in the left ear, while the parotid and mastoid regions became much swollen. After some days of acute suffering pus escaped from the left meatus, to her great relief. A week afterwards her medical attendant, Mr. Reginald Bower, was summoned (Feb. 23, 1884) on account of a sudden and alarming hæmorrhage from the same ear. The blood was bright red in color, and he estimated the loss at upwards of half a pint, and the duration of the bleeding at something less than 5 minutes. It had nearly ceased to flow before his arrival, but he made the arrest complete by local pressure. The child was greatly alarmed and remained almost motionless in dread of recurrence. This took place on the 25th, sud-

denly as before, and to an equal or even greater amount, the flow again ceasing spontaneously. Between this and the 27th there were a few slight jets, and the pus was blood-tinged.

I saw her on the evening of the 27th, when her exsanguinated condition and the general history pointed to the internal carotid as the source of bleeding, and indicated the advisability of immediate ligation of the common carotid. I proceeded to perform the operation at once, but before my arrangements could be completed another hæmorrhage occurred. I had thus an opportunity of witnessing the blood spurt out in a greater gush, and of ascertaining that the flow was manifestly controlled by compression in the neck.

I completed the operation as expeditiously as possible, with the result of instantly and permanently arresting the bleeding. The ligature used was a piece of ordinary silk; it came away on the fourteenth day and the wound quickly cicatrized under ordinary dressings. On the day following the operation she was much relieved, having lost her anxious alarmed look and much of the pain, but her condition was one of extreme prostration. On the second day she suddenly lost her speech, and complete aphasia continued until the end of the third week, when she suddenly uttered the words, "mother," "Mr. Bower," in their presence. During this time her mind was quite clear, and she was able to read and write nearly as well as ever. Her convalescence proceeded satisfactorily till the sixth week, when it was interrupted by an attack of nephritis, with dropsy, from going out too soon. After a time her health became fully established and is now excellent in every respect.

Among numerous features of interest in the case I select the following for further comment: First, as to the source of bleeding. It may be considered that this still remains doubtful, and that it is still undecided whether an erosion of the internal carotid artery was really the cause, inasmuch as no post-mortem was made, but if that objection be urged, direct proof can never be obtained, and the question of a possible recovery after ligation, for this cause, must always be undecided.

I entertain no doubt myself, on this point, for the blood spurted from the ear in great gushes of bright red color with each beat of the heart, and in a quantity which no other artery in the neighborhood could furnish a fraction of.

The intermittent character of the bleeding and its frequent spontaneous arrest are features which Politzer considers char-

teristic of bleeding of this kind, and from this source, he says, that with these symptoms the diagnosis must be accepted as certain. In the thirteen cases which he submits to critical observation, the hæmorrhages varied in number from 1 to 20, the duration of each attack from 4 to 10 minutes, and the period from the commencement of the first bleeding till the fatal issue, from 5 minutes to 4 weeks. Three of the cases appear to have been treated by ligature of the common carotid, but unsuccessfully. It should be stated that in the great majority of the cases there was old standing and destructive disease of bone, and in general, there was suppuration within the skull. Consequently the conditions were not nearly so favorable for recovery, as in my patient's case. In her, suppuration of the mucous membrane of the tympanum must have led to a carious erosion of the thin plate of bone separating the cavity from the carotid canal, and opposite this point the exposed arterial wall, being bathed in pus, became so weakened that a small aperture formed in it.

Toynbee (*Med. Chir. Trans.*, vol. 43, p. 218) considered that acute inflammation of the tympanum is more likely to lead to a carious erosion of this plate of bone than a chronic disease, and he cites two cases in illustration.

The autopsy of the thirteen cases previously referred to, showed that the aperture in the artery rarely exceeded two lines in length, and that it is always situated at the bend where the vessel passes from the vertical to the horizontal direction. From this point to the final breaking up of the vessel within the skull a great length of artery intervenes, so that there is nothing to prevent the obliteration of the vessel by a ligature thrombus, if the local reparative changes in the vicinity of the eroded carotid are favourable. Such favourable changes would likely be established in an acute otitis like this, where the bone lesion is limited and superficial.

It furnished an interesting feature to observe the rapidity with which all signs of local inflammation began to abate on the application of the ligature. The parotid and cervical swellings, which had been considerable, began to shrivel at once, and only one small abscess required to be dealt with. The discharge from the ear did not materially abate for three

weeks. After that it subsided rapidly, till the fourth of the month, when it was almost at vanishing point. It has relapsed since on a few occasions, from taking cold, but for some months has quite dried up.

It appears certain that the brain symptoms did not set in at once. The girl spoke after the operation, and did not lose her speech for two days, when it suddenly left her. She uttered no word for three weeks, but understood what was said to her, and could read and write as well as ever. The movements of the right arm were more sluggish than of the left, but there did not appear to be any impairment of sensation. At the present time her memory and intellect are perfectly good. Dr. C. W. Suckling has recently investigated her condition, and reports as follows: "There is no trace of aphasia now, but the speech is a little slowed. The right side of the face is evidently in a parietic condition. There is no deflection of the tongue. The grasp of the right hand is exactly equal to that of the left, viz: forty kilogrammes. On considering the present symptoms and past history, I have no doubt that the girl has had ataxic aphasia, and the variety sometimes called aphemic (where written language is unaffected), and paralysis of the right side of the face. I attribute these symptoms to an interference with the circulation through the branches of the left middle cerebral artery supplying the third left frontal convolution and the convolution of the operculum on the left side, the latter being the centre for the face and hand. I think this was probably due to embolism or thrombosis, most probably the latter, for there was an interval of forty-eight hours after the ligature before the onset of the symptoms."

It appears certain that ligature of the main trunk is the only means of treatment which offers the slightest prospect of recovery in these cases. Compression in the neck or local pressure at the meatus is in no way to be relied upon, although the intermittent character of the bleeding and its frequent spontaneous arrest might, for a time, lead to a belief in their efficacy; nor is the usual rule of treatment of wounded arteries at the seat of injury possible of accomplishment. Of the uselessness of pressure at the meatus, I had an illustration about the same time this case came under my care. By a

curious coincidence of practice, a fortnight before I attended this girl, I was summoned to the scarlet fever wards of the Borough Infectious Hospital, to see a child in an advanced stage of the disease, in whom some severe hemorrhage from the auditory meatus had taken place. There had been profuse suppuration from the ear for some time, and the child appeared to be hopelessly ill with abscess of the neck and bone caries. I made arrangements to ligature the common carotid, if the bleeding, which had ceased for some time, recurred, giving instructions to the attendant in that event to plug the meatus pending my arrival. This was done, and the consequence was that a great gush of blood came from the mouth and nose, of which the child died. Here, the blood, finding its ready outlet barred, made its way down the Eustachian tube, as perhaps ought to have been foretold. I don't think she could have got well under any circumstances, but the lesson of the case, I was, fortunately, very shortly afterwards, enabled to put to practical account. It is mentioned by Politzer only to be condemned, along with such measures as astringent injections and application of cold, etc. He entertains no hope of success from anything but ligature of the common carotid, and expresses the conviction that, though hitherto uniformly unsuccessful; the possibility of a successful issue is not precluded in future operations.